
Office of Inspector General

*Management Advisory Memorandum on
National Airspace Infrastructure
Management System Prototype
Federal Aviation Administration*

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I. INTRODUCTION

This is our Management Advisory Memorandum on the National Airspace System (NAS) Infrastructure Management System (NIMS) prototype project in the Federal Aviation Administration (FAA). Our review was initiated in response to a hotline complaint alleging that an FAA official had an unethical relationship with the contractor developing the NIMS prototype. The hotline was not substantiated. However, during our review we identified several issues concerning the NIMS prototype contract that FAA management should address.

In March 1995, FAA's Airway Facilities (AF) initiated a NIMS prototype effort to change the way it was providing management services. At that time, the acquisition side of FAA was continuing to focus its resources on enhancements of the existing remote maintenance monitoring subsystem, a project initiated in the early 1980's. AF, not familiar with procurement policies, initiated a change order to an existing automatic data processing (ADP) services contract to do the prototype effort. Today, AF is considering issuing a single source contract to continue this prototype development. Concurrently, the acquisition office is embarking on a major acquisition for NIMS. The NIMS project as listed in FAA's Aviation System Capital Investment Plan has an estimated cost at completion of over \$128 million.

On May 17, 1996, we raised significant concerns about the current prototype effort to responsible FAA organizations. While some concerns were addressed, the basic issue remains that two separate efforts are ongoing with the same goal, and one of these efforts has many contractual problems. Since AF plans to issue a new contract in March 1997 to continue the

prototype effort, we are issuing this advisory in final form without first issuing a draft report. However, we did provide FAA officials a “discussion draft” copy of this advisory. We considered their comments and made changes where appropriate.

Background

AF is responsible for ensuring the safe and efficient use of the NAS through transition, integration, sustaining, and maintenance engineering and field support of current systems that comprise the NAS. As FAA moves from a ground-based NAS infrastructure to a hybrid system of both space- and ground-based components, AF’s basic mission will remain the same. However, in the future, many AF services will be provided through system command and control technology in centralized operations control centers (OCC).

As part of AF’s long-term strategic plan, it developed a future operations concept called NAS Infrastructure Management (NIM). Future operations will shift from decentralized equipment maintenance to centralized service management. As part of that strategy, all NAS infrastructure operations and maintenance activities will be directed through OCCs.

NIMS is the automated system that implements NIM. The NIMS Program will provide technologically sound solutions to work force management and fault management for the NAS infrastructure, and will support work force consolidation and increase work force productivity.

The purpose of the NIMS prototype is to perform rapid testing of AF’s operations concept based on the establishment of NIMS. The prototype objectives are to (1) provide near-term capabilities to improve AF operations by exploring the use of commercial-off-the-shelf products; (2) provide an experience base to help refine requirements, procedures, costs, and benefits; and (3) demonstrate the validity of the AF concept for future operations. AF has installed prototype systems in nine regions including the Alaska Region and one at the National Maintenance Control Center in Herndon, Virginia. A prototype system is also installed at FAA’s Technical Center in Atlantic City, New Jersey. Each region has a Prototype Operation Control Center and is tasked with focusing their review of the prototype software in a specific area. For example, the Western Pacific Region will concentrate on event ticketing, the Central Region on work force management, and the Northwest Mountain Region on telecommunications.

Scope and Methodology

The review was initiated on May 7, 1996, and included a review of the overall management of the NIMS prototype project. We reviewed the NIMS prototype contract and related budget and financial data. We also reviewed FAA policy and Comptroller General decisions relating to appropriation availability. We met with the Director and staff of the Office of Communication, Navigation and Surveillance Systems within Research and Acquisition; Airway Facilities Service personnel; the Assistant General Counsel for FAA's Procurement Law Division; and the NIMS prototype contractor, Electronic Data Systems (EDS) in Herndon, Virginia. In addition, we interviewed other industry officials for their perspective on the current functional requirements of the NIMS prototype.

II. RESULTS AND RECOMMENDATIONS

Results of Review

The NIMS prototype effort did not follow standard acquisition practices and procedures. A contract modification for the NIMS prototype was outside the scope of the existing contract. FAA did not follow its policy and used funds from its Operations account to develop the system. In addition, FAA did not have a source of funds to complete the project. These conditions occurred because the project was started without the support and approval of FAA management responsible for system development, and contract administration was inadequate. As a result, despite spending over \$12.5 million, FAA does not own any hardware or the rights to any software or software licenses under the prototype. Furthermore, there is no assurance that continuing the prototype will be useful to the \$128 million NIMS project in the Capital Investment Plan.

Discussion

FAA Order 1810.1F, Acquisition Policy, in effect at the time the prototype was initiated, established policy for initiating and managing acquisition programs within FAA. It provided a framework for establishing valid, authentic mission needs and translating them into stable, affordable acquisition programs that meet user requirements. The order required acquisitions to conform to certain key decision points including a mission need determination approved by the Associate Administrator of the sponsoring organization before proceeding to full-scale development.

Despite FAA's Acquisition Policy, AF initiated the procurement action for the NIMS prototype project in March 1995 by submitting the request for

a change order to an existing ADP support contract. The period of performance was 36 months and the change order was definitized on February 1, 1996, for a total value of \$18,464,978. The office with primary responsibility for researching, designing, developing, procuring and implementing the NAS infrastructure was not responsible for the prototyping effort. AF wanted to move forward with its strategic plan and begin shifting to centralized service management and making culture changes in the regional work force. Since AF was not the responsible organization within FAA for system development or acquisition, the NIMS prototype project did not follow appropriate acquisition practices.

Contract Selection and Award

Contract selection was limited to contractors who had existing FAA contracts. Further, FAA awarded the NIMS prototyping requirement as a modification to the Computer Resources Nucleus (CORN) contract where the scope of services was not related.

The Federal Acquisition Regulation requires contracting officers to promote and provide for full and open competition in soliciting offers and awarding Government contracts. FAA limited contract selection to seven companies that had existing contracts in place. The FAA team formed to consider the proposals concluded that the offer from the CORN contractor was the best in terms of technical merit and approach. However, in discussions with team members, no one was sure what criteria was followed in selecting the CORN contractor, EDS. Additionally, FAA could not provide documentation on the original cost estimate or provide a rational basis for using the CORN contract as a contract vehicle.

On May 17, 1996, we sent a memorandum to the Associate Administrator for Research and Acquisitions and the Director, Airway Facilities Service, recommending FAA place a hold on all contractual commitments for new or continuing development of NIMS prototyping and any related activities until we completed our review. We also requested FAA's Procurement Law Division to review the scope issues of using the CORN contract for NIMS prototyping. We were concerned that the use of the CORN contract to obtain the NIMS prototype was outside the scope of the contract and the prototype may have been improperly funded with Operations, Facilities and Equipment (F&E), and Research, Engineering and Development (R,E&D) appropriations.

Contract Scope Issues. Although FAA continued to fund the prototype project, in a July 17, 1996, memorandum from the Procurement Law Division to the Contracting Officer, Counsel concluded the NIMS effort

raises legitimate questions of scope. The original CORN contract requires EDS to provide an automated data processing resource consisting of system configuration of hardware, software, network interfaces, interfacility communications, and other resources. According to FAA's Procurement Law Division neither the original contract nor EDS's proposal contemplated using CORN to develop new systems. The original purpose of the contract was to use CORN to host FAA application systems onto the contractor's service. The contractor's effort for the prototype is testing a new system as part of a development effort. The prototype effort does not use the contractor's service to host an existing FAA system. The Procurement Law Division advised the Contracting Officer to justify any future NIMS work to be performed under the CORN contract as a single source contract.

In addition, the Procurement Law Division identified that the pricing of the prototype was not an in-scope equitable adjustment to the contract. Instead, the NIMS prototype was priced as new work. For example, CORN is a fixed-priced contract while portions of the NIMS prototype are priced as a level of effort task. To compound the problem, the original CORN contract is funded by F&E appropriations while the prototype is funded by the Operations appropriation.

Use of Appropriated Funds. FAA did not adhere to its own funding criteria or follow the General Accounting Office Principles of Federal Acquisition Law when funding the NIMS prototype. FAA Order 2500.8A dated April 9, 1993, provides guidance on the selection of appropriations within FAA. According to FAA Order 2500.8A, Operations funds should be used for the recurring administrative, operating, and maintenance cost of doing the agency's business. F&E funds should generally be used for procuring and installing new equipment, facilities, and construction projects included in the Capital Investment Plan. The order also states that R,E&D funds should be used for research and development programs that improve the NAS by increasing its safety, security, productivity, capacity, and environmental compatibility.

We found that AF may have misused Operations funds in its attempt to build a new system. The project was first funded with \$1.2 million in R,E&D funds. Congress eliminated R,E&D funding for FAA's Future Airway Facilities Technology account in Fiscal Year (FY) 1996 curtailing activities regarding the operational infrastructure. The Senate Committee on Appropriations stated the research was operationally driven and could safely be deferred. In order to continue developing the NIMS prototype, AF looked for other funding mechanisms to keep the effort moving. First, AF obtained \$3.4 million of Operations funds from the Telecommunication Support and International Division. Second, it attempted to obtain \$3.1

million in F&E funds from the Office of Communications, Navigation, and Surveillance Systems. After we brought the attempted transfer of F&E funds to the attention of FAA's Procurement Law Division, the program office was advised that the use of F&E funds was inappropriate.

In our view, the NIMS prototyping effort should have been funded only by the R,E&D account and then transitioned to F&E once it became part of the CIP acquisition process. According to FAA Order 2500.8A, R,E&D funding would be the source of correct funding action to use in a build and test environment.

AF's use of Operations funds to continue the prototype effort raises another issue. According to the General Accounting Office's Principles of Federal Appropriation Law, once an agency makes an initial election as to which appropriation to use, it cannot thereafter, because of insufficient funds in the selected appropriation, change its election and use another appropriation.

Contract Administration Procedures

The Contracting Officer and the Contracting Officer's Technical Representative (COTR) did not provide adequate oversight over the NIMS prototype contract. The Contracting Officer did not follow required procedures for initiating a Delegation of Authority (DOA) for the COTR. The NIMS COTR did not have a DOA and did not have a thorough knowledge of his responsibilities. The COTR is responsible for monitoring the contractor's performance to ensure that all the technical requirements under the contract are met by the delivery date or within the period of performance and at the price stipulated in the contract. The COTR must ensure the personnel being used by the contractor are of the same caliber that was originally proposed by the contractor to the Government. The COTR is also responsible for establishing and maintaining a contract administration file to record all contractor and Government actions pertaining to the contract. The contract administration file should include copies of the contractor's invoices/vouchers, progress reports, and other contract deliverables.

When we requested data on the contract, we found the COTR did not maintain files on the contractor's activities or performance. He was unable to furnish invoices, cost data, or qualifications of individuals working on the level of effort portion of the contract. Furthermore, the COTR recommended new work to the project through engineering change proposals which increased the cost of the current contract. These factors are contributing to the steady increase in costs experienced by FAA. The average monthly funding level of the contract has increased from \$490,963

during the first 16 months to a current monthly level of \$950,000. While costs are increasing, there are no deliverables to be made under the contract at this time.

Hardware, Software, and License Issues Unresolved. The NIMS prototype modifications to the CORN contract do not currently provide FAA with ownership of the commercial-off-the-shelf (COTS) hardware, software, or software licenses in the event of termination or completion of the NIMS prototype tasking. FAA entered into a lease-to-ownership agreement with EDS for the hardware and may exercise the option after ordering 36 months of service. Consequently, FAA does not currently have rights to the eight regional OCCs including servers, workstations, backup tape devices, laptops, and printers. In addition, the transferability of software licenses owned by the contractor was not discussed or included in the pricing that was negotiated. According to the Contracting Officer, this was an oversight. In order to obtain the software licenses, FAA would have to negotiate the transfer of the licenses from the contractor to FAA. At that point, the contractor would submit a cost proposal to FAA. Although the contractor stated that they are willing to act as a facilitator, there is no guarantee that this will occur.

Capital Investment Plan and NIMS Prototype Transition

The overall NIMS project in the Capital Investment Plan was first funded in FY 1997 with \$6 million and the FY 1998 request exceeds \$23 million. The project's purpose, approach, and benefits duplicate the NIMS prototype. For example, the FY 1997 budget submission stated NIMS funding is needed to prototype commercial hardware and software solutions for sensor connectivity, fault management, and work force management. The project is being managed by FAA's Research and Acquisition Office, not Airway Facilities.

The NIMS prototype effort is still underway. But, in an effort to correct past problems and obtain a dedicated source of funding, AF is attempting to transition the NIMS prototype to the Research and Acquisition Office. Personnel from both offices have become part of the NIMS integrated product team. Also, AF has appointed a new COTR to correct past problems and is trying to provide a rational basis for single source contracting for NIMS prototype services.

The product team is considering terminating the CORN contract modification thus terminating the equipment leases. FAA may then purchase the hardware for as much as \$2 million or install new Government

owned equipment in their place. In September 1996, at the very time FAA was leasing hardware from EDS, the prior COTR initiated a purchase request under a National Aeronautics and Space Administration contract for 13 Sun Enterprise Servers, 52 Sun Workstations, and 12 Sun System Memory Modules for a total value of \$1,545,947. The equipment is currently being installed in the regions. The product team may also issue a single source contract to EDS in March 1997, to provide documentation on all software code/application that may be of use to FAA. According to FAA officials, that contract could cost more than \$6 million over a 6-month period. Any new development would be accomplished after “firm requirements” are developed by the product team. At the same time that AF is continuing its NIMS prototyping efforts, the Office of Research and Acquisition is starting a major acquisition for the NIMS Program with an estimated cost of over \$128 million. FAA was authorized \$6 million for fiscal year 1997 and the Office of Research and Acquisition plans to issue an integration support contract later this year that will include NIMS work.

Management’s Position

On February 13, 1997, we provided copies of our “discussion draft” to the Office of Research and Acquisition and the Procurement Law Division. Officials from these offices told us they agreed with our conclusions. We also met with the Director of Airway Facilities, and on February 20, 1997, his office provided written comments. AF’s comments can be summarized into two general areas. First, the AF prototype project made significant contributions to the entire NIMS effort. According to AF a significant investment was made; and it is beginning to yield results in key areas of requirements development, concept validation, and culture change. Second, AF maintains NIMS prototyping was not a full scale development effort and therefore acquisition practices and procedures did not apply to AF.

Conclusion

We do not disagree that the prototype effort has made contributions to the overall NIMS Program in areas of work force culture change. However, we are not convinced that continuing the prototype effort will yield significant contributions to the overall NIMS Program. Further, we disagree with AF’s position that acquisition practices and procedures did not apply to the prototype effort because it was not a full-scale development effort. AF has established NIMS prototype projects in all nine FAA regions, not four as originally planned. In our view, the NIMS prototype effort went beyond AF’s original concept of “build a little-test a little.” When obtaining new systems in the future, AF should follow existing acquisition guidelines and

work with the Office of Research and Acquisition and not proceed on their own.

After spending about \$12.5 million, FAA does not know if the prototype will be useful to the product team developing the NIMS as authorized in the Capital Investment Plan. Accordingly, FAA should terminate the contract modification for the NIMS prototype, and before it issues any single source contract for continuing the prototype determine if the NIMS prototype effort has any utility to the Government and the future integration support contractor.

Recommendations

We recommend the Acting FAA Administrator:

1. Require Airway Facilities to follow existing acquisition procedures and guidelines when acquiring new systems.
2. Terminate NIMS prototyping under the CORN contract.
3. Analyze the prototype's potential benefits to the overall NIMS Program and determine whether it has any utility to the future integration support contractor before awarding a single-source contract to continue NIMS prototyping.

Action Required

In accordance with Department of Transportation Order 8000.1C, we would appreciate receiving your written comments within 30 days of the date of this report. Your comments should indicate concurrence or nonconcurrence with the recommendations. If you concur, please advise us of the actions taken or planned and the estimated completion dates. If you nonconcur, we request an explanation of your position and alternative courses of action to resolve the issues.

If you have any questions, please call me on x61992 or Alexis M. Stefani on x60500.

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